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ABSTRACT

The specific objective of Work Unit ATC-PERFORM was to provide technical research and development assistance to the Army agencies involved in the review, evaluation, and refinement of performance-based training techniques in Army Training Centers. It continued and extended the Army's effort to accomplish major training innovations that had been initiated in 1971-72, during conversion to an all-volunteer status. A brief background to Work Unit ACT-PERFORM is provided and an overview of the work unit's activities and priorities is sketched. The report describes the work unit's activities and accomplishments in basic training, advanced individual training, advanced individual training (combat support), self-pacing individualized instruction, and Reserve and National Guard training and noncommissioned officer leadership/instructor training. Performance training and testing principles and techniques in those areas were instituted and reflected in Army training documents, pamphlets, instructional and assessment materials, and Army staff policy decisions. (Author/AJ)

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Establishing the Concepts and Techniques of Performance-Oriented Training in Army Training Centers: A Summary Report

John E. Taylor and Staff, ATC-PERFORM

HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street • Alexandria, Virginia 22314

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June 1975

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Prepared for

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This report describes the activities and accomplishments of Work Unit ATC-PERFORM in a three-year effort to assist the Army in the review, evaluation, and refinement of performance-based training in Army Training Centers. ATC-PERFORM continued and extended the Army's first effort to effect major training innovations in its conversion to an all-volunteer status, previously reported in *The Concepts of Performance-Oriented*

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Instruction Used in Developing the Experimental Volunteer Army Training Program, HumRRO Technical Report 72-7, March 1972. Under ATC-PERFORM, HumRRO staff members working in close coordination with Army representatives of the appropriate proponent schools and training centers, undertook subefforts in (a) Basic Training (Basic Combat Training for Men, Basic Training for Women, and BCT skill retention), (b) Advanced Individual Training, Combat (Infantry, Armor, Field Artillery, and Air Defense Artillery), (c) Advanced Individual Training, Combat Support (Signal, Transportation, Ordnance, Clerical, Quartermaster, and Military Police), (d) self-pacing of instruction in supply and heavy equipment courses, (e) NCO leadership and instructor training courses, and (f) training for Reserve Components. Performance training and testing principles and techniques in the above enumerated areas were instituted and reflected in (a) a variety of Army training documents (Army Subject Schedules, Programs of Instruction, Army Training Programs), (b) a number of pamphlets in the TRADOC 600 series, (c) instruction and assessment materials for a wide variety of specific courses of instruction, and (d) Army staff policy decisions. The accomplishments of ATC-PERFORM are further documented in six companion reports and several consulting reports.

SUMMARY AND CONCLUSIONS

PURPOSE

The specific objective of ATC-PERFORM was to provide technical research and development assistance to the Army agencies involved in the review, evaluation, and refinement of performance-based training techniques in Army Training Centers. It continued and extended the Army's effort to accomplish major training innovations that had been initiated in 1971-72, during conversion to an all-volunteer status.

APPROACH

Working under the sponsorship of the Deputy Chief of Staff for Training of the U.S. Army Training and Doctrine Command (TRADOC), multiple team efforts were undertaken in a wide variety of subefforts germane to the establishment of performance-oriented training in Army Training Centers. Several subefforts of varying duration and depth of coverage were pursued over a three-year time interval. The major areas and subdivisions of work in their approximate order of priority were (a) Basic Training which included Basic Combat Training (BCT) for Men, BCT Skill Retention, and Basic Training (BT) for Women; (b) Advanced Individual Training which included Infantry, Armor, Field Artillery, and Air Defense; (c) Advanced Individual Training (Combat Support) which included Signal, Transportation, Ordnance, Clerical, Quartermaster, and Military Police; (d) Self-Pacing of Instruction which included Cognitive Skills in the Supplyman Course, and Motor Skills in the Crawler Tractor Operator Course; (e) Training for Reserve Components; and (f) NCO Leadership/Instructor Training.

When specific projects were undertaken, attempts were made to establish a tripartite relationship involving HumRRO and the appropriate Army Training Centers, and proponent schools to ensure coordinated conduct of the work.

Depending upon the need existing at the time, research and development assistance was provided in such diverse activities as task analysis, performance test development, building instructional systems, conducting evaluations, designing experiments on the effects of instructional innovations, collecting and analyzing questionnaires and interview data, generating or revising training literature, and orienting training managers and instructors.

EFFECTS

This program of research and development facilitated the institution of performance training and testing concepts and techniques across a broad spectrum of Army courses of instruction in the several major areas enumerated previously. The institution of these concepts and techniques is reflected in (a) a variety of Army training documents including Army Subject Schedules, Programs of Instruction, and Army Training Programs; (b) a number of pamphlets in the TRADOC 600 series; (c) instruction and assessment materials for a wide variety of specific courses of instruction; and (d) Army staff policy decisions.

CONCLUSIONS

Specific Conclusions

A number of specific sets of conclusions have been drawn from the several sub-efforts comprising this program. Such conclusions, germane to the specific studies from which they were drawn, are summarized here and in the body of the report. Detailed findings and conclusions are included in six reports prepared as companions to this overall summary document.

General Conclusions

1. *Performance-oriented training and testing.*

These concepts and techniques are clearly applicable across the spectrum of BCT, AIT, and AIT(CS) in the Army's training base. Significant positive impact occurs in a number of areas:

(1) The availability of explicit performance goals, and their use to assess the effects of instruction, sharpens the focus of training toward the production of soldiers with demonstrable skill repertoires.

(2) Trainee interest and motivation to achieve the goals of instructional programs are enhanced.

(3) Participation in performance-oriented training and testing systems enhances the professional competence of the NCO instructor.

These performance-oriented training and testing concepts and techniques are equally applicable to the training missions of the Reserve Components. However, an effective means for accomplishing application has yet to be devised.

2. *Institutional change.* Concentrated effort applied over time is required to accomplish innovation in Army training. Innovation is facilitated and hastened in the Army training base by

(1) Involving the training research and development change agent, the training proponency, and the training operator in a close working relationship.

(2) Actively involving the on-site cadre in the planning for accomplishing change.

(3) First changing the tests by which training effectiveness is assessed; instructional practice will then change to reflect the tests..

3. *Systems engineering of training*, properly applied, is an effective vehicle for designing instruction to meet field duty requirements.

4. *Individualization or self-pacing of instruction*, in combination with performance-oriented training, provides the potential for accelerating individuals through the training base and improving cost-effectiveness substantially.

5. *The management and conduct of training* constitute an important component of the spectrum of duty performed by junior officers and NCOs. An effective and systematic delivery system for providing them the tools of modern training technology has yet to be devised.

6. The conduct of *training research and development* in operational training settings requires a high degree of flexibility in approach and expectation. Unanticipated operational priorities frequently preclude the elimination, control, or even measurement of the effects of extraneous variables. Precise measurement of clear relationships between input variables and behavioral change must often be traded for the less precise tracking of global effects and long-term trends.

PREFACE

The work described in this report was accomplished under the sponsorship of the Deputy Chief of Staff for Training of the U.S. Army Training and Doctrine Command (TRADOC). Its specific objective was to provide technical assistance to the Army agencies involved in the review, evaluation, and refinement of performance-based training in Army Training Centers. This work continued and extended the Army's effort to effect major training innovations during its conversion to an all-volunteer status. Accomplishments, products, and findings have been reported previously to the appropriate Army agencies. This report was prepared to document the overall effort which extended over the period FY73 to FY75.

ATC-PERFORM was a part of the work program of HumRRO's Western Division at the Presidio of Monterey, California, with Dr. Howard H. McFann as Director. The work was actually carried on by teams composed of representatives from the staffs of several HumRRO offices. Dr. John E. Taylor of the Monterey office served as Work Unit Leader, and was responsible for overall management of the several concurrently running subefforts. Members of the Monterey office staff who were responsible for the conduct of individual subefforts or specific studies were Jacklyn E. Hungerland, Eugene R. Michaels, Mark F. Brennan, Dr. Morris Showel, Dr. J. Richard Suchman, Dr. William H. Melching, and Dr. Robert Vineberg.

ATC-PERFORM team members from the HumRRO office of the Central Division at Fort Rucker, Alabama, were H. Alton Boyd and L. Paul Dufilho.

Team members from the HumRRO office of the Western Division at Fort Bliss, Texas, were Leo C. Benson, Dr. Albert L. Kubala, and Dr. Robert D. Baldwin.

Team members from the HumRRO office of the Central Division at Fort Knox, Kentucky, were William L. Warnick, G. Gary Boycan, J. Patrick Ford, James H. Harris, and Dr. Douglas L. Young.

This work was conducted under the sponsorship of the U.S. Army Research Institute for the Behavioral and Social Sciences. Dr. Milton Maier and Dr. Otto Kahn served successively as technical contract monitors. Administrative and logistical support for the work was provided by the U.S. Army Research Institute Field Unit, Presidio of Monterey, commanded by COL Ullrich Hermann.

Liaison with the sponsor, Deputy Chief of Staff for Training, TRADOC, was maintained through a number of action officers in the Basic Combat Training and Advanced Individual Training Branches of the Army Training Center Division. COL Mason I. Young, Jr. and COL Jack L. Conn served successively as directors of that division during the conduct of ATC-PERFORM.

HumRRO research in ATC-PERFORM was conducted under Army Contract DAHC19-73-C-0004. Army Training Research is conducted under Army Project 2Q062107A745.

Meredith P. Crawford
President
Human Resources Research Organization

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Chapter 1

BACKGROUND TO ATC-PERFORM

INTRODUCTION

Prior to the establishment of Work Unit ATC-PERFORM, HumRRO research and development studies for the Army had focused on the use of performance-oriented training as a vehicle for the effective training of people at all aptitude levels. For example, Work Unit SPECTRUM had studied training method-to-aptitude relationships; and Work Unit APSTRAT had developed, tested, and implemented a peer-instructional program based on a new combination of instructional principles that defined performance-oriented training.[1]

To implement the Federal Government's announced plans to reduce reliance upon the draft and to undertake conversion to an all-volunteer Army by July 1973, the Department of the Army established the Office of the Special Assistant for the Modern Volunteer Army (OSAMVA) in the fall of 1970, under LTG George I. Forsythe. SAMVA's master plan proposed that the effects of extensive innovations be tested in depth and over a broad front, beginning as soon as practicable. In November 1970, HumRRO representatives spent several days at the Pentagon, at SAMVA's request, assisting with the development of two of the components of the master plan: (a) formulating an approach to accomplish large-scale innovations in the Army Training Center (ATC) system, the Experimental Volunteer Army Training Program (EVATP), and (b) evaluating the effects of innovations in Army life-style. Based upon the findings of considerable prior research and the field demonstration of the successful use of performance-oriented training in APSTRAT, LTG Forsythe's SAMVA study group recommended use of this performance approach in training programs developed to meet the needs of the Modern Volunteer Army. SAMVA proceeded with these activities under Project VOLAR.

Beginning late in FY71 and continuing through FY72, HumRRO conducted its Work Unit VOLAR (Support of the Army's Field Experimentation on Service Attractiveness and Training Programs) to accomplish two major activities:

(1) The development and evaluation of the Experimental Volunteer Army Training Program (EVATP) at Fort Ord.

(2) Analytic evaluation of Modern Volunteer Army (MVA) life-style and context innovations at Forts Ord, Jackson, Carson, Benning, and Knox.

[1] See HumRRO Technical Reports:

Hilton M. Baleh, John E. Taylor, and Robert N. Hauke, *Instructional Strategies for Training Men of High and Low Aptitude*, Technical Report 73-10, April 1973.

Kenneth Weingarten, Jacklyn E. Hungerland, and Mark F. Brennan, *Development and Implementation of a Quality-Assured, Peer-Instructional Model*, Technical Report 72-35, November 1972.

HumRRO's role in evaluating the effects of life-style innovations is the subject of a separate report series.[1] HumRRO Technical Report 72-7, *The Concepts of Performance-Oriented Instruction Used in Developing the Experimental Volunteer Army Training Program*, dated March 1972,[2] describes the planning, development, and implementation of the EVATP over the period mid-November 1970 through June 1971.

ACTIVITIES FROM JUNE 1971 THROUGH JUNE 1972

A letter from the U.S. Continental Army Command (now U.S. Army Training and Doctrine Command—TRADOC) had directed that all training programs conducted in U.S. Army Training Centers (USATCs) be reviewed and revised to ensure that these programs be challenging, demanding, kept modern, and attuned to changing needs.[3] Program revisions were to be based upon the results of systems engineering of training, the principles of the EVATP, and other actions having implications for such revisions. Performance-oriented instruction and testing were to be incorporated wherever feasible; HumRRO technical assistance was to be used during revision or redesign of instruction.

Over this one-year period, the primary effort of the training component of Work Unit VOLAR was directed toward following through on the EVATP and APSTRAT training innovations initiated during FY71, and providing technical advice and assistance to Army Training Centers and Schools on their revisions to training. During the second half of 1971, HumRRO staff concentrated attention on Basic Combat Training (BCT) and Advanced Individual Training (AIT) as follows.

Assistance was provided on a continuous basis to Fort Ord training personnel in their refinement and revision of the EVATP performance tests and development of a quality-control system.

Staff members participated in the 1-6 August conference at the U.S. Army Infantry School (USAIS) which was convened to accomplish the revision of BCT and AIT Infantry. Representatives from TRADOC, USAIS, HumRRO, and all ATCs attended. New performance-oriented Army Subject Schedules (ASubjScds), with performance tests for each subject, resulted from this milestone conference.

HumRRO personnel assisted Fort Ord staff in the preparation of a TRADOC-requested TV tape illustrating the concepts of performance-oriented training. This TV tape was subsequently used widely in the orientation of training personnel of Headquarters staffs, ATCs, and proponent schools.

Assistance was provided in the orientation of training personnel from other ATCs, and proponent schools where performance-training principles were to be implemented in instruction. This was accomplished by having contingents from other locations travel to

[1] See the following HumRRO Technical Reports:

Robert Vineberg and Elaine N. Taylor, *Summary and Review of Studies of the VOLAR Experiment, 1971: Installation Reports for Forts Benning, Bragg, Carson, and Ord, and HumRRO Permanent Party Studies*, Technical Report 72-18, May 1972.

S. James Goffard, James S. DeGracie, and Robert Vineberg, *Attitudinal Studies of the VOLAR Experiment: Permanent Party Personnel, 1971*, Technical Report 72-25, August 1972.

S. James Goffard, James S. DeGracie, and Robert Vineberg, *Attitudinal Studies of the VOLAR Experiment: Men in Training, 1971*, Technical Report 72-31, October 1972.

S. James Goffard, James S. DeGracie, and Robert Vineberg, *Attitudinal Studies of the VOLAR Experiment: A Longitudinal Study, 1971-72*, Technical Report 73-6, March 1973.

[2] John E. Taylor, Eugene R. Michaels, and Mark F. Brennan, *The Concepts of Performance-Oriented Instruction Used in Developing the Experimental Volunteer Army Training Program*, Technical Report 72-7, March 1972.

[3] CONARC letter ATIT-AT, Subject: Revisions to Army Training Programs for USATCs, dated 6 April 1971.

Fort Ord where they observed training/testing innovations, and interacted with Ord and HumRRO staff. Key personnel from Fort Dix, Fort Knox, the Ordnance School, and Fort Polk were oriented in this manner.

At the request of TRADOC, traveling teams of HumRRO staff visited ATCs and Schools, and briefed command, staff, and training personnel on performance-training and testing principles, as follows:

28-29 October	Fort Polk, Louisiana
2-3 December	Fort Knox, Kentucky
6-7 December	Fort Campbell, Kentucky
9-10 December	Fort Leonard Wood, Missouri
7-8 December	Fort Gordon, South Carolina
9-10 December	Fort Jackson, South Carolina

Varying degrees of understanding, acceptance, and willingness to incorporate the performance concepts were encountered at the several posts, ranging from highly positive to highly negative.

The effort during the first half of 1972 was directed toward following through on the several actions initiated previously, to assist Fort Ord, other ATCs, and proponent schools in converting to the new programs for BCT and AIT. As enumerated below, such assistance was extended to include a number of other ATCs and proponent schools as they undertook review and revision of their courses, as directed by the 6 April 1971 CONARC letter. Specific work was as follows.

HumRRO staff prepared and submitted a prototype revised ASubjScd to TRADOC appropriate for use in performance-oriented training and testing. This prototype was task oriented and specified what the soldier must do, as opposed to previous subject schedules which were subject oriented. The prototype was utilized by TRADOC in providing guidance as to the content of subject schedules, the stating of performance objectives, and the inclusion of performance tests.

Assistance was provided to the training staff of three combat support training courses (AIT[CS])—Cook, Wheel Vehicle Mechanic, and Radio Operator—at Fort Ord in preparing performance tests for their respective courses.

Army personnel visiting Fort Ord to observe performance-oriented training continued interaction with HumRRO staff. They included key personnel from Fort Carson, the Infantry School, the Quartermaster School, the Southeastern Signal School, the ATC at Fort Jackson, and TRADOC.

At the request of the Commanding General, Fort Ord, HumRRO undertook a subeffort to assist in the revision of the Instructor Training Course for cadre and the Basic Leadership Courses for trainee leaders at Fort Ord to begin incorporating performance-oriented training and testing concepts. This was the initial effort to introduce the concepts into the areas of instructor training and noncommissioned officer (NCO) leadership.

Fort Ord staff was assisted in implementing a new BCT-AIT testing program under the new TRADOC-approved BCT and AIT courses.

Again, at the request of TRADOC, HumRRO traveling teams made visits to other ATCs and proponent schools to brief command, staff, and training personnel on performance-oriented instruction as follows:

10-11 January	Fort Dix, New Jersey
12-13 January	Aberdeen Proving Ground, Maryland
14 January	Fort Belvoir, Virginia
17 January	Fort Lee, Virginia
18 January	Fort Eustis, Virginia

1-2 February	Fort Sill, Oklahoma
2-4 February	Fort Polk, Louisiana
14-16 February	Fort Sam Houston, Texas
16-18 February	Fort McClellan, Alabama

Again, attitudes were found to range from positive to negative. Civilian instructors at the proponent schools, and NCO instructors in the ATCs, were found to be the most reluctant to change. Occasionally clear-cut resistance and adamant refusal to innovate were met. Considerable time and patience were required to ameliorate such situations.

During the second quarter of 1972, while continuing to assist Fort Ord in the refinement of their performance-oriented instructional methods across the board, the research staff assisted other ATCs as they introduced the concepts into their NCO instructor and Drill Sergeant training programs. HumRRO representatives visited the ATC at Fort Jackson in April to assist them in revising their instructor courses and their mid-cycle and end-of-course testing in BCT. In May, a HumRRO representative visited Fort Polk to assist the ATC in establishing its program of testing and application of quality-control measures. Many of the quality-control techniques developed at Polk were later adopted by the other ATCs.

As part of TRADOC's effort to reorient the NCO Academy and Drill Sergeant School courses, HumRRO representatives attended the NCOA/DSS Symposium held 12-16 June 1972 at the Infantry School. As a result of this conference, the instructional objectives in the revised Program of Instruction for these two courses were stated in relatively performance-oriented terms.

In June 1972, HumRRO representatives attended a TRADOC conference of the Directors of Plans and Training of all the ATCs where views on the content of BCT, and the application of performance-oriented training methods and performance testing were exchanged.

Over the period March-May 1972, HumRRO personnel held a series of briefings and conferences on performance-oriented training for command, staff, and training personnel of two reserve divisions, the 91st Division (Training) and the 104th Division (Training) in preparation for their summer active training duty to be performed at Fort Ord. This was the initial attempt to orient the reserve components on implementing the concepts and techniques of performance-oriented training and testing.

Beginning in July 1972 (FY73), these varied activities were continued and expanded under Work Unit ATC-PERFORM, Review, Evaluation, and Refinement of Performance Training in Army Training Centers. The sponsor was Headquarters, TRADOC and the objective was to assist the Army in evaluating and improving performance-oriented training in BCT, AIT, and AIT(CS) programs.

Chapter 2

OVERVIEW OF ATC-PERFORM ACTIVITIES AND PRIORITIES

ATC-PERFORM's general mission was to provide research and development assistance to the Army as it converted its basic and advanced individual instruction to a performance-oriented system. This work was viewed as a major catalyst in effecting massive change and training innovation in the Army's training base. The impact of the work was to be reflected in the training conducted at all ATCs.

Throughout ATC-PERFORM's three-year program of activities, whenever specific courses of instruction were addressed, close three-way coordination was established involving HumRRO, the appropriate ATC (or ATCs), and the cognizant proponent school. Oftentimes, HumRRO staff members found themselves serving as the bridge between the opposing philosophies of the ATC trainers and the proponent school course developers. In such cases a rapprochement had to be effected before constructive development work could be undertaken.

The work actually undertaken on any given subeffort was determined largely by the need existing at the time of initiation—for example, technical assistance in analyzing tasks, developing performance tests, conducting evaluations, building instructional systems, revising ASubjScds, orienting instructors, designing experiments, and collecting and analyzing data on the effects of innovative techniques, writing training documents, and so on. ATC-PERFORM operated as a highly applied, flexible, and priority-responsive R&D activity, providing assistance where and when it was required.

With the formal initiation of ATC-PERFORM in July 1972, work was continued in the areas already under way, as discussed in the previous chapter, and several new subefforts were added. Subefforts undertaken immediately were in AIT for armor crewman and reconnaissance specialists at Fort Knox, and for field artillerymen at Fort Sill. As the work progressed, and as other ATCs and proponent schools expressed interest in having HumRRO technical assistance, subefforts were added in AIT for air defense crewmen at Fort Bliss and in AIT(CS) for field wiremen, light vehicle drivers, supplymen, and clerks at Fort Ord.

Later in FY73, plans were made to (a) undertake studies to assess BCT skill retention, (b) determine the feasibility of using self-pacing instructional techniques, and (c) performance-orient the Basic Training Program for the Women's Army Corps (WAC). An additional high-priority activity requested by TRADOC was the writing of a manual, for use by ATC training managers and instructors, on the conduct of performance-oriented training.

Early in FY74, progress briefings were provided to the sponsor, the Deputy Chief of Staff for Individual Training (DCSIT) at TRADOC and his staff. As a result of these meetings with the DCSIT and his staff, new requirements were established. Two major areas, the performance-orientation of BCT and of AIT, Infantry were considered to require no further HumRRO attention and were phased out. One major area was added, performance orienting the training of military policemen. Priority activities for ATC-PERFORM in FY74 were established in the following order of precedence:

(1) WAC—Performance-orienting basic training.

(2) BCT—Assessing the retention of BCT skills.

(3) AIT and AIT(CS)—Performance-orienting the following MOSs:
94B - Cook
63B - Wheel Vehicle Mechanic
95B - Military Policeman
76A - Supplyman
11E - Armor Crewman
11D - Armor Reconnaissance Specialist
75D - Personnel Clerk
All MOS - Field and Air Defense Artillery

(4) Self-Pacing—Developing pilot programs in the Engineer 63B Crawler Tractor and QM 76A Supplyman courses.

(5) Reserve Components—Identifying problem areas associated with performance training and testing.

(6) Instructor Training Courses—Enhancing ability of NCO instructors in ATCs to conduct performance training and testing.

Work in FY74 followed this priority list, with all subefforts being conducted approximately concurrently. Staff assignments were made proportional to the priority of each subeffort. As particular subefforts were completed, staff would be diverted to those remaining. At the end of FY74 an interim progress report was prepared for the ARI technical monitor summarizing the activities and accomplishments of FYs 73 and 74. Paralleling this written report, a briefing was prepared for the TRADOC sponsor. Because of problems in scheduling a briefing, the eventual presentation of selected data and results was accomplished in two meetings held with the Commanding General and the DCSIT of TRADOC.

Guidance received from the sponsor late in FY74 indicated that priorities for ATC-PERFORM during its last year, FY75, would be generally the same as those for FY74, but with the phasing out of Reserve Components, and Instructor Training courses. Work continued under this guidance through FY75.

The sections which follow summarize the work conducted in specific areas during the three years that ATC-PERFORM was active.

Chapter 3

BASIC TRAINING

BASIC COMBAT TRAINING FOR MEN

The BCT subeffort under ATC-PERFORM was a carryover from VOLAR in which considerable work had previously been done to reorient instruction to performance-oriented methods. Much of HumRRO's prior work had taken place at Fort Ord, the site of the EVATP experiment, with infrequent visits to other training centers. Although TRADOC had closely monitored the conversion to performance training in all ATCs, there remained some areas of difference in content within BCT subjects, differences in tests and testing procedures, and differences in training standards for both instruction and testing. At all training centers, the BCT graduate was considered to be more proficient in his basic tasks when trained under the new system than the graduate produced under the conventional classroom-lecture methods. However, it was TRADOC's desire that there be a greater degree of standardization of the BCT product. This could be attained only by achieving agreement on the content and priority of material within each subject area, by using uniform procedures for administering proficiency tests, and by standardizing the training and testing procedures.

In August 1972, TRADOC invited HumRRO representatives to attend a conference at Fort Polk, at which the Infantry School (proponent agency for BCT subjects), TRADOC, and all the ATCs were represented. During this conference, all BCT performance tests were reviewed in detail. The ATCs and the Infantry School reached agreement on BCT content, on priorities within subject areas, performance tests, test administration, and standards for instruction and testing. The benefits of HumRRO's extensive involvement in the BCT area, under Work Units VOLAR and ATC-PERFORM, are reflected in the following four Army actions:

(1) Implementation of performance-oriented training methods in BCT in all six of the then-operating Army Training Centers.

(2) Application of uniform performance testing procedures at each Army Training Center to reduce variability in the quality of the trained graduate from each ATC.

(3) Development of a pocket-size booklet for issue to each recruit containing all the performance tests required for graduation from BCT. The initial issue of this booklet, TRADOC Pamphlet No. 600-4, *Soldier's Manual Army Testing (SMART), Basic Combat Training*, was in December 1972. As the training content and time allotments for BCT have been revised, this pamphlet has also been revised, but the concept and purpose of the pamphlet have remained the same. TRADOC Pamphlet 600-4, dated 1 April 1974, is the current version.

(4) Development of TV tapes paralleling each of the BCT performance tests contained in the "SMART Book." These provided visual demonstration of all the tasks trainees are required to perform.[1]

[1] A study was conducted at Fort Ord to develop techniques for using the "SMART Book," the TV tapes, and ETV to accomplish training review, makeup, remediation, and skill practice. A report of the results of this study is on file at HumRRO's Western Division, Presidio of Monterey, California.

Subsequent HumRRO activities in BCT instruction and testing were confined to providing technical assistance in areas where a training center would request assistance. At Fort Ord, this took the form of reviewing instruction in specific subjects, and analyzing training review periods and testing procedures whenever training results evidenced some instructional or testing problems.

The success of these efforts in BCT, dating from the initial EVATP work, lead to TRADOC requests for HumRRO work in two related areas: Basic Combat Training skill retention, and WAC Basic Training.

BASIC COMBAT TRAINING SKILL RETENTION

A comprehensive research plan for the longitudinal assessment of BCT skill retention and Infantry AIT skill retention, with the latter comparing ATC and Unit AIT graduates was submitted to TRADOC in June 1973. In August 1973, TRADOC requested that the ATC versus Unit AIT comparison be eliminated. A revised plan for the retention substudy was prepared and submitted to TRADOC in November 1973. The plan called for determining skill retention of BCT graduates, serving in both combat and combat-support assignments, after varying amounts of time from the date of the individual's completion of BCT.

In March 1974, TRADOC indicated monetary restrictions precluded implementation of the revised November 1973 plan and proposed an abbreviated plan whereby military personnel would collect data at Fort Knox and HumRRO personnel would analyze the data and report the findings. The TRADOC proposal was found to be inadequate for control over test administration and data collection, and it did not provide for the collection of baseline data. This proposal was tabled.

HumRRO then initiated a limited pilot retention study to provide the Army with data on the retention of skill and knowledge acquired in performance-oriented BCT at Fort Ord during March-June 1974. This study was conducted in lieu of the more comprehensive studies of retention that had been proposed to the Army but could not be supported. A total of 200 graduates finishing BCT during the period 4 March - 18 April were tested again six weeks later over the period 17 April - 13 June. Thirteen BCT tests, ranging from "easy" to "difficult," were included in the retention study. Of the 200 individuals tested, 44 were Mental Category II, 120 were Category III, and 36 were Category IV.[1] The data were analyzed and a report of the study was prepared as one of the six companion reports to this technical report.[2]

It was found that the probability of the soldier passing a given subtest at the end of BCT was .81, and during retention testing six weeks later, .63. For individual subtests, the average decrement in performance ranged between 5 and 44%. Mental Category II soldiers performed better than those in Categories III and IV.

It was concluded that although the study was limited to the single and relatively short retention interval of six weeks, it provides the most recent data available. Studies employing longer retention intervals, and determining the training necessary for the reinstatement of diminished or lost skills are needed. Such studies would provide information about (a) the shapes of retention curves over longer periods of time, (b) the

[1] Percentile scores on the Armed Forces Qualification Test for Category I are 93-100; Category II, 65-92; Category III, 31-64; and Category IV, 10-30.

[2] For details of the BCT retention study, see HumRRO Technical Report, *A Study of the Retention of Skills and Knowledge Acquired in Basic Training*, by Robert Vineberg, TR-75-10, June 1975.

amount of training required for skill recovery, and (c) optimal time to provide retraining for reinstatement and retention of skills.

BASIC TRAINING PROGRAM FOR WOMEN

Early in January 1973, HumRRO was requested by TRADOC to analyze and submit comments on draft Army Training Program (ATP) 21-121, Basic Training Program for Female Military Personnel. It was determined that substantial improvement could be made in performance orientation of both instructional and testing techniques for the WAC Basic Training Program, and a team from HumRRO visited Fort McClellan in March 1973 to plan a program for providing assistance. An agreement was reached with representatives of the WAC Center and School to undertake a comprehensive systems engineering of the entire Basic Training Program. The planned beginning date was July 1973.

The work, as originally laid out, was a system-engineering, performance-orienting project to be accomplished in two phases. Phase I was intended to produce data from a number of sources to answer the question, "What should a Women's Army Corps (WAC) BT graduate be able to do in order to meet the Army's requirements during her first tour of duty?" Phase II was intended to develop and field test a revised (experimental) BT program based on the Phase I data describing the duties, activities, and needs of first-tour enlisted women, and incorporating performance-oriented training principles.[1] Students trained under the revised, experimental BT and those trained under the conventional, ongoing BT Program would have been tested and the results used to develop a field-responsive BT Program.

HumRRO personnel visited Fort McClellan in the summer of 1973 to establish coordinated efforts between HumRRO, Fort McClellan and WAC Center and School personnel. A HumRRO Working Group composed of WAC personnel and HumRRO scientists was established to work with the Director of Training of the WAC School in the conduct of the project.

Before the systems engineering effort could begin, TRADOC requested that HumRRO provide extensive on-site assistance at the WAC Center for revising the existing WAC Basic Training Program along performance-oriented lines. This included assistance in performance-orienting the seven-week ATP 21-121 then in use and selected associated ASubjScds. This assistance was provided and a somewhat revised ATP was published on 20 June 1974.

In September 1973, the longer term systems engineering of WAC BT, being conducted by the joint WAC-HumRRO Working Group, was resumed.

TRADOC suggested the maximum use of TRADOC Regulation 350-100-1, *Systems Engineering of Training (Course Design)* in the project. To provide the data base required by that document, a questionnaire to be administered world-wide to a representative sample of first-tour enlisted women (EW) was constructed. Also, a structured interview and written questionnaire was developed for use with a sample of supervisors of first-tour EW. After thorough testing, the EW questionnaire was submitted for examination and comment to U.S. Women's Army Corps Center and School, Fort McClellan, Headquarters, Fort Jackson, the Director's Office, WAC, and TRADOC.

[1] The performance-oriented training concept as applied here embodies the following six principles: (1) performance-oriented instruction, (2) absolute criterion, (3) functional context, (4) individualization, (5) feedback, and (6) quality control. These principles are explained in TRADOC Pamphlet 600-11, *Guidelines for the Conduct of Performance-Oriented Training*, 22 October 1973.

Subsequently, the questionnaire was mailed to 44 Army installations, world-wide, to be administered by installation project officers to a large representative sample of first-tour EW. Eighty-three percent of the questionnaires (N=2,936) were returned completed. A sample (N=1,573) of the completed questionnaires was selected as representative of the first-tour EW population, and the questionnaire data were keypunched and computerized to form the data file from which analyses would be made.

One hundred fifty-six supervisors of first-tour EW at Continental United States (CONUS) installations were interviewed for their assessments of first-tour EW activities, strengths, and needs. These data were analyzed, interpreted, and put to use before the EW questionnaire data.

Basically, the questionnaires and interviews were designed to determine what activities taught in BT are actually performed during the first tour and what degree of importance (to the mission of the unit and to the respondents' success as soldiers) is associated with their performance by both job incumbents and their supervisors.

While EW data analyses were being run, TRADOC in September 1974 requested an interim evaluation of the Phase I results, tentative findings, recommendations, and a schedule for the remainder of the project. An interim report was submitted in October which described Phase I data collection activities, discussed the results of data which had been analyzed, offered tentative conclusions based on those data, and included a milestone schedule.

The two-phase approach described was truncated in November 1974, when the Phase II objectives were changed[1] to concentrate efforts on performance-orienting the content areas already contained in the June 1974 draft Army Training Program (ATP) 21-121, Basic Training Program for Female Military Personnel. A project completion date was set for 31 March 1975. The HumRRO Working Group was reorganized and new priorities were established for the remainder of the project:

(1) The ATP was to be rewritten in more performance-oriented terms,

(2) Current instructional operations were to be performance-oriented through the implementation of the "six principles,"

(3) Briefings were to be prepared for key training personnel at Forts McClellan and Jackson on selected data collected in Phase I,

(4) Close coordination of inputs to the proposed new ATP among Forts McClellan and Jackson and HumRRO were to be maintained.

Efforts to institute the "six principles" were undertaken at Fort McClellan. In response to the November TRADOC message, stepped-up efforts to implement performance-oriented training included (a) meetings of training personnel to discuss the applications of the performance-oriented techniques to be used and (b) repeated on-site visits by training evaluators to facilitate the processes by which implementation of the "six principles" was occurring.

Meetings with Fort McClellan training personnel, including curriculum committee chiefs and instructors and company training personnel, were held to evaluate the ongoing process of performance-orienting those blocks of instruction dealing with observable skills and to involve more training personnel in that activity. An evaluation form was developed to be used in determining the degree to which blocks of instruction meet performance-orientation criteria. Data collected in late February and March indicated a definite quickening in the process of *implementing*, and *refining*, the use of the "six principles" by instructors.

Computer programing and analysis of the first-tour EW data were performed on Army computers on a time-available basis. These analyses provided responses grouped by

[1] TRADOC letter ATTNG-AT-B, Subject: ARI-HumRRO Work Unit ATC-PERFORM—Women's Basic Training, dated 19 November 1974.

(a) Military Occupational Specialty (MOS) Career Management Field (CMF) and (b) six-month intervals of time-in-the-Army of the respondents.

In early March 1975, representatives of all parties involved met to draft the Army Training Program (ATP) incorporating inputs from all sources, including TRADOC and Fort Jackson.

Briefings on Phase I data were prepared by HumRRO personnel for presentation to Fort McClellan and Fort Jackson training personnel. Supervisor and first-tour EW data were selected to give examples of the duties and activities of first-tour EW, their evaluations of the importance of those activities to their success as soldiers, their evaluations of BT and subsequent Army life, and demographic descriptions of the respondents.

During conduct of the work progress briefings were given:

(1) The Commanding General of Fort McClellan and Commander of the WAC Center and School, 11 January 1974.
(2) Director, WAC, 19 February 1974.
(3) Director of Training, WAC Center and School, Fort McClellan, 6 March 1974.
(4) ARI research staff, 5 July 1974.
(5) Chief, Army Training Center (ATC) Division, and Chief, Professional Development Division, TRADOC, 19 July 1974.
(6) The Commanding General of Fort McClellan; Commander, and DOT, USWACCS, and staff members, 13 September 1974.
(7) Fort McClellan training personnel, 25 March 1975.
(8) The Commanding General of Fort Jackson, 26 March 1975.
(9) Fort Jackson training personnel, 26 March 1975.

In summary, the varied activities of this subeffort resulted in several products: first, construction of a relatively more performance-oriented ATP; second, the implementation at Fort McClellan of the "six principles"; and third, a large body of computerized data which may be used to improve the appropriateness and cost-effectiveness of BT.

The proposed new ATP is a substantial move in the direction of making BT a maximally effective, field-responsive program. By specifying more precisely than in previous ATPs what it is trainees are required to do as the result of instruction, training managers are able to pinpoint what behaviors BT graduates need to develop. In addition, those responsible for conducting training are provided specified BT graduate behaviors they can train toward and assess to achieve an effective training program.

A report describing these activities is being prepared as one of the companion reports to this technical report.[1]

[1] For details of the WAC BTP study, see HumRRO report "The Performance Orientation of Women's Basic Training," by H. Alton Boyd, L. Paul Dufilho, and John E. Taylor, in preparation.

Chapter 4

ADVANCED INDIVIDUAL TRAINING

ADVANCED INDIVIDUAL TRAINING, INFANTRY

As in BCT, the ATC-PERFORM work for AIT Infantry completed activities initiated during the EVATP experiment conducted at Fort Ord in FY71. The original design for the EVATP experiment had called for 16 weeks of integrated and uninterrupted BCT-AIT Infantry training, with no administrative reassignment of trainees at the completion of BCT. This design would have permitted sufficient telescoping of time for a trainee to become proficient in the 11B (Light Weapons Infantryman), 11C (Indirect Fire Crewman), and Armored Personnel Carrier (APC) driver skills. The design was for "through put" for those going into Infantry MOS. However, due to Department of Army requirements imposed by the Vietnam conflict, the through-put design had to be altered. Administrative reassignment of many of the BCT graduates after eight weeks continued, and a requirement for mandatory Vietnam indoctrination training precluded a trainee's acquiring all three Infantry skill areas during the following eight weeks of AIT training. The design actually used in the EVATP experiment permitted a soldier to become proficient in all the BCT skills and two of the three Infantry skill areas (the 11B skills, and either the 11C or APC driver skills) in 16 weeks. HumRRO Technical Report 72-7, cited previously, gives details on how this design was executed.

Under ATC-PERFORM, HumRRO effort was directed toward assisting the Infantry School and TRADOC in reviewing and refining the new performance-oriented AIT Infantry programs in order that they might develop a practical program for use by all Infantry Training Centers.

In October 1972, HumRRO was requested by TRADOC to attend a conference at the Infantry School to review the School's proposed ATC-wide program, and to participate in a formal AIT Infantry Workshop with representatives of all Infantry Training Centers. HumRRO representatives stressed during both the conference and the workshop the necessity for designing courses based on task inventories for each MOS. The workshop accomplished the following:

(1) Development of task inventory lists and performance objectives for MOS 11B, 11C, and 11H (Direct Fire Crewman).

(2) Definition of performance criteria for each block of instruction.

(3) Retention of the tri-cycle (peer instruction) system of instruction for mortar crewman. This was a joint Fort Ord-HumRRO product used in the training of men in the 11C skill area which had proven to be highly successful.

(4) Establishment of end-of-block performance testing for each subject.

AIT Infantry was phased out of the ATCs at Fort Jackson and Fort Ord in early 1973, leaving Fort Polk the only ATC conducting training in the three Infantry MOSs. With the subsequent implementation of the through-put or one-station BCT-AIT training concept at Fort Polk, for those who volunteer for Infantry training, many of the elements of the program developed in the original EVATP experiment were adopted.

These activities completed the ATC-PERFORM involvement with AIT Infantry.

ADVANCED INDIVIDUAL TRAINING, FIELD ARTILLERY

Early in 1972, as part of the effort by TRADOC to acquaint various Army commands with the findings of the EVATP experiment, HumRRO personnel visited the 1st AIT Brigade at Fort Sill, where they briefed the brigade commander, his immediate staff, battalion commanders, and training officers.

Because the brigade commander, already had an interest in, and was attempting to, performance-orient field artillery training, some modifications in this direction were already underway in the training at Fort Sill. The general climate was receptive to the performance concept, and plans were made for HumRRO to provide more direct assistance to the brigade training staff.

In April 1972, two HumRRO researchers spent a week at Fort Sill helping brigade personnel select specific courses for trial implementation of performance-oriented training. It was jointly agreed to select the Pershing Missile Course (MOS 15E) and Fire Direction Center Course (MOS 13E) as primary targets. With the aid of HumRRO researchers, brigade personnel began by reviewing the duties, tasks, and skills to be acquired in these courses, and by eliminating the use of certain lecture/conference classroom practices.

Pershing Missile Course

During a visit by a HumRRO representative to the brigade in August 1972, it was determined that training personnel could benefit from a visit to Fort Ord where they could observe performance-oriented instruction in practice (Field Wireman Course). Personnel from the Pershing course made such a visit, during which particular emphasis was placed on the use of peer instruction.

As a result of observing the Field Wireman Course, the Pershing training staff developed a training schedule that incorporated peer instruction, while still satisfying other course constraints. Subsequently, there was much interest in incorporating performance training concepts in Pershing training, but surges in trainee input precluded attempts to implement peer instruction techniques.

By January 1973, input to training cycles was stabilized and trial implementation of peer instruction began. Training personnel were enthusiastic about the technique, but after only two or three cycles, input again became irregular and full use of peer instruction was postponed indefinitely.

Fire Direction Center Course

Because of the positive effects of the visit to Fort Ord on Pershing training staff, the brigade commander sent training personnel from the Fire Direction Center (FDC) Course for a similar visit. This visit, made in late September 1972, resulted in the development of performance tests and instructional modules, and preparation of a training plan to incorporate them with peer instruction in the FDC Course.

While interest in peer instruction was evident in the FDC course, the absence of a specific directive authorizing trial deviations from the approved Subject Schedule led to a reluctance by training personnel to explore the use of such instruction in the course. Also, the skill level of this course (13E20) caused some instructors to question the advisability of permitting students to act as "instructors."

During the time of HumRRO's involvement in the FDC course, training personnel were continually increasing the course's performance orientation. Although there was reluctance to adopt peer instruction, there was no hesitancy to use performance concepts as a general approach. Instruction took place in formal classrooms, but the amount of lecture/conference instruction became less and less. Instructors actively employed the

basic concepts of performance training: demonstration, practice, feedback, and evaluation. As early as September 1972, the assistant S-3 of the FDC battalion volunteered that, since performance training concepts had been introduced, the battalion recycle rate had dropped from 10% to some low value (not specified).

Basic Cannoneer Course

During FY73, a HumRRO representative traveled to Fort Sill and visited the training brigade seven times to review implementation efforts and to provide on-site guidance and assistance. In several of these visits, efforts were made to interest brigade training personnel in using the peer-instruction system in the Basic Cannoneer Course (MOS 13A10). However, because trainees were found to be able to score satisfactorily on established performance tests using existing procedures, training personnel could see no need to consider such an undertaking.

Over time, the Cannoneer course, like the Pershing and FDC courses, came to be highly performance oriented, and in late FY73, the performance testing of Cannoneer trainees became centralized, providing for objective evaluation and quality control.

Activities in FY74

During FY74, only one visit was made by a HumRRO representative to Fort Sill. Autovon contact was maintained with training personnel in the Pershing battalion and the brigade S-3 office to provide assistance as required. The interest in peer instruction continued during the year, but according to training personnel at the site, irregular input of trainees precluded real use of this instructional technique.

It had been anticipated that the extent of Lance training (MOS 15D), a new course, would increase during FY74 and that there would be a special interest in peer instruction in that weapon system. Again, however, trainee input to that training battalion remained too erratic to permit full use of the technique.

The fluctuating input situation for both Pershing and Lance courses remained substantially unchanged in FY75; therefore, no need for HumRRO assistance existed. The end of FY74 marked the completion of ATC-PERFORM's involvement with AIT Field Artillery.

ADVANCED INDIVIDUAL TRAINING, AIR DEFENSE ARTILLERY

In January 1973, the commanding officer of the 1st AIT Brigade (AD), Fort Bliss, expressed interest in receiving HumRRO assistance in the revision of selected air defense AIT programs in consonance with the objectives of ATC-PERFORM. It was agreed that the initial work would be done in the 4th Training Battalion for MOS 16P, Chaparral Crewman. In February a working group consisting of 4th Battalion and HumRRO personnel undertook the following activities:

(1) Review of the AIT training objectives for this MOS.

(2) Development of formal performance-based proficiency tests to be used in training for this MOS.

(3) Development of the training literature needed to accomplish individualized training using peer-instruction techniques.

(4) Formulation of plans for implementation of the revised program of training.

In early April, the program was given a pilot run in the 4th Training Battalion with a small number of trainees. In May, the initial full-scale use of the performance-based peer-instruction technique occurred for Class 10-73 for MOS 16P.

In April 1973, the commanding officer of the 3d Training Battalion requested HumRRO assistance in implementing the ATC-PERFORM concepts for MOS 16C, Hercules Launcher Crewman. Performance-based tests were developed from the existing training guides and implemented with Class 21-73 at the end of May. Conversion of the course to peer instruction techniques began in June.

Additional assistance was requested in September for conversion of training for MOS 16B, Hercules Fire Control Crewman and two Hawk operator training programs, MOS 16D and 16E, all conducted by the 3d Training Battalion.

In late September 1973, HumRRO staff learned that the 4th Training Battalion was about to implement peer instruction for MOS 16R, Vulcan Crewman. To that point the conversion of this program has been entirely an "in-house" effort by the 4th Training Battalion and HumRRO assistance had not been sought. Contact with the chief instructor for this program disclosed that he had not had access to the relevant technical reports needed as background for conversion efforts. As a result, the revised training program for the Vulcan Crewman had not included preparation for a formal GO/NO-GO testing program. Nevertheless, the innovations and planning that had been accomplished by the chief instructor, without assistance, were impresive. The peer instruction method was implemented for Vulcan Crewman training in October 1973 without a formal testing program. Additional contacts with the chief instructor for 16R during October-December revealed that tests were being prepared on a time-available basis.

During October and November, the 3d Training Battalion continued their conversion efforts to the performance-based instructional model. The revised training for the Hercules Launcher Crewman appeared to be operating smoothly and no major implementation problems were evident. Little progress had been made in converting the AIT program for 16B, Hercules Fire Control Crewman, because of problems associated with student congestion in the tactical radar vans.

Implementation of the new methods for the Hawk Crewman training programs proceeded in a somewhat irregular fashion. Conversion of the training for MOS 16D proceeded more smoothly than that for MOS 16E. The major obstacle to progress seems to have been lack of a full appreciation of the role and significance of detailed and proceduralized descriptions of the proficiency tests. The original drafts of the tests required the staff and peer instructors to cross-reference and concurrently use locally produced test forms and the Department of the Army Technical Manuals. Eventually, the instructional staff came to recognize that the formal proficiency tests (which are also used as peer-instructor training guides) needed to "spell out" the complex task procedure, rather than requiring the instructor and trainee to physically manipulate several information sources. Development of such single source documents for proficiency testing was under way early in December for MOS 16D, with a total of 14 such tests being produced.

To summarize test development in other MOSs: For MOS 16B, standard performance-based tests were developed for the 11 job procedures included in the AIT program. Special standardized tests were not developed for either 16C, Hercules Fire Control Crewman, or 16E, Hawk Fire Control Crewman, since training in these programs involves use of classified Field Manuals which describe the step-by-step procedures associated with these duty positions. Eighteen performance tests were developed in support of training for MOS 16R, Vulcan Crewman, and 17 tests for MOS 16P, Chaparral Crewman.

While monitoring conduct of the conventional and revised training programs, the HumRRO staff became aware of incompatibilities between the reading abilities of some trainees and the reading levels required by the texts and Department of the Army Technical Manuals (TMs) used in the 1st AIT Brigade's training programs. These incompatibilities were seen as a problem for any MOS for which use of TMs is a job

requirement, and particularly for MOS 16C. Discussions with instructors revealed that a significant percentage of trainees had reading difficulties.

As a result, HumRRO proposed that a trial program of evaluation of reading abilities be initiated in the 3d Training Battalion. Under such a program, administered by the Education Branch, Directorate of Personnel and Community Services of the U.S. Army Air Defense Center, two groups of new input trainees were given the U.S. Armed Forces Institute Intermediate Reading Test in November-December 1973. In addition, HumRRO scientists evaluated the readability levels of a sample of TMs used in the 3d Training Battalion's programs.

The results of these preliminary trainee and document examinations suggested that serious reading disabilities are characteristic of a fairly large proportion of the trainees (40% of 375 trainees were reading below the 8th-grade level). Subsequently, the Education Branch offered remedial reading instruction, under the Army Preparatory Training Program, for those reading at the 4th-grade level and below. The program was still being offered as of the date of this report.

By the close of FY74, performance-based peer-instruction methods were in various stages of successful implementation in the 1st AIT Brigade (AD). The training programs for the Chaparral, Vulcan, Hawk Launcher, and Hercules Launcher Crewmen were fairly well stabilized and well developed. Modification of the training for Hercules Fire Control and Hawk Fire Control Crewmen continued to be hampered by the necessity to use tactically-configured radar systems for Hercules training, and classified Field Manuals for Hawk training. No specific assistance by ATC-PERFORM staff was programed for FY75. Limited, short-term assistance was provided as requested.

ADVANCED INDIVIDUAL TRAINING, ARMOR

The overall objective of the Armor subeffort of ATC-PERFORM was to assist the Armor Training Center in the development and installation of performance-based training in the Armor Crewman (11E) and Reconnaissance Specialist (11D) MOS training programs. The work was accomplished in four sequential phases extending over approximately three years:

Development of task inventories for each MOS.
Development of training objectives for each task.
Development of performance tests for each objective.
Field test and refinement of resulting training programs for both MOSs.

All activities were accomplished through the efforts of working groups composed of representatives from the Armor Training Center and HumRRO, working in coordination with the Armor School. The provisions of TRADOC Regulation 350-100-1 for the systems engineering of training were followed closely in the work.

The first major activity was to develop task inventories for each MOS. The working group reviewed the existing Army Subject Schedules and lesson plans to identify tasks currently addressed in the two courses. To these lists were added tasks that experienced Armor NCOs and officers, combining their cumulative experience with the results of prior and current systems engineering efforts, found to be required for job entry-level. These lists were refined by working groups and submitted to panels of experts from each of the Armor Center's training brigades for further refinement. In addition, the current availability of GO/NO-GO criteria and appropriate performance tests for the listed training requirements was ascertained. The results of these activities are presented in a HumRRO Consulting Report.[1]

[1] G. Gary Boycan and William L. Warnick, *Training Requirements for the Armor Crewman and Reconnaissance Specialist Advanced Individual Training Programs*, HumRRO Consulting Report CR-D2-72-7, November 1972.

Following determination of all the task requirements, the working group turned to the developing of training objectives, stated in performance terms, for each task. These statements of objective were written in sufficient detail to serve as instructors' guides for demonstrating and teaching the procedural tasks, and as aids to trainees' practice of task performance. Each objective statement included the performance sequence to be learned, the conditions under which it was to be performed, and the standard to be met.

These training objectives provided the basis for the group's third major activity, that of developing performance tests. This phase developed GO/NO-GO measures of performance designed to ensure that each trainee reached entry level proficiency on each objective. Performance measures for various objectives were grouped into specific test configurations designed to increase ease of administration of the various measures and enable trainers to put the performances in environments that approached the on-the-job context. The prime objective was to develop measures that, taken together, would constitute batteries of relevant performance tests suitable not only as the major instructional vehicles but also as job-performance aids for use in these two MOSs.

As the tests for the various course blocks were completed, they were staffed through appropriate Armor School and Center agencies for review as to their accuracy, appropriateness, and feasibility for use in instruction. These reviews also served to refine the task lists further. The results of these reviews were presented in two HumRRO consulting reports.[1]

The next activity to be undertaken by the working group was the analysis of the ongoing conventional training programs to determine where revisions in training content and methods should be made for each MOS. These analyses identified instructional blocks unrelated to bringing trainees up to entry-level performance in MOS-related skills. Such instruction was eliminated and the time saved was allocated to performance-oriented instruction in essential skills. ASubjScds 17-11E10 and 17-11D10 were revised and sent to TRADOC in January 1974; they included the performance test batteries developed previously. The ASubjScds were subsequently approved by TRADOC.

During analysis of the conventional programs, it became apparent that training to the designated standards for all objectives would require not only changing content and time allocations, but also the extensive incorporation of the performance-training principles referred to earlier in this report, and presented in TRADOC Pamphlet 600-11. That incorporation was accomplished by:

(1) Conducting extensive observations of ongoing training to determine where and how performance training and testing techniques could be introduced.
(2) Revising the AIT lesson plans accordingly.
(3) Briefing training managers and instructors on the characteristics and the strategies for tryout of the new programs.

The performance-oriented training program for AIT Reconnaissance was implemented in May 1974 and for AIT Armor in July 1974. Appropriate data on trainee performance, course administration, trainee and trainer attitudes, and cost-effectiveness were collected.

During FY75, the ATC-PERFORM staff focused on three major activities:

(1) Monitoring the ongoing implementation of the two training programs to assist in their conversion to performance-oriented techniques. This was accomplished as

[1] J. Patrick Ford, James H. Harris, and Peter F. Rondiac, "Performance Measures for the AIT Armor Crewman," HumRRO Consulting Report, April 1974.

James H. Harris, J. Patrick Ford, and B.B. Bell III, "Performance Measures for AIT Reconnaissance Specialist," HumRRO Consulting Report, April 1974.

part of the Brigade S-3's continuing review of training to solve any problems indicated by performance test results.

(2) Consulting with the ATC Evaluation Section in three areas to (a) develop data needed to evaluate the effectiveness of the revised programs, (b) establish procedures for sampling tests for mid- and end-of-cycle trainee performance evaluation, and (c) revise performance tests and the related instruction to reflect anticipated changes in equipment or time constraints when they occurred.

(3) Using the information generated in (1) and (2) in a continuing empirical refinement of lesson plans to ensure they implemented performance training methods.

As part of the implementation-evaluation-refinement process, a large body of data were collected during the AIT cycles for 10 troops of Reconnaissance Specialist (11D) trainees and for 14 companies of Armor Crewman (11E) trainees conducted at the Armor Training Center, Fort Knox, late in FY74 and early FY75. General findings are summarized below.

As other studies concerned with the adoption of the results of research and development have found, the accomplishing of institutional change is time-consuming and difficult in a large training center. This is so for a number of reasons:

(1) The training load is heavy.
(2) Ongoing operational training activities have precedence and must not be interrupted.
(3) Demands on time of training staff are already heavy.
(4) Turnover among training personnel is high.

When such conditions prevail, quick conversion to new instructional techniques cannot be expected. Rather, conversion occurs over extended periods of time in a somewhat incremental fashion. Further, close monitoring of the system undergoing revision must be maintained to assure that planned innovations are incorporated, and that once incorporated they do not "wash out."

Over time the performance-oriented training system came to function better as (a) training and testing techniques were refined, (b) standards for performance became more firmly established, and (c) performance data were fed back into the system indicating areas where further attention was needed.

In summary, it was concluded that:

(1) Conducting large-scale training R&D and effecting institutional change in Army field training operations is arduous and time-consuming. Constant monitoring of the system under study, coupled with a flexible approach to research design and experimental control are essential, if priority operational requirements are not to negate the effort.

(2) The incorporation of performance-oriented training concepts and techniques into Armor Advanced Individual Training Programs produces graduates with demonstrated high levels of skill as entry level reconnaissance specialists and armor crewmen.

(3) Such programs are cost-effective in that they can be implemented without increasing the personnel, time, and facility costs of training.

A separate report, prepared as one of the six companion reports to this overall summary report, presents detailed information on ATC-PERFORM's activities in AIT Armor.[1]

[1] For details of the Armor study, See HumRRO Final Report *Development, Fieldtest, and Refinement of Performance Training Programs in Armored Advanced Individual Training* by Douglas L. Young and John E. Taylor, FR-WD(CA)-75-8, June 1975.

Chapter 5

ADVANCED INDIVIDUAL TRAINING (COMBAT SUPPORT)

As was the case for ATC-PERFORM's several subefforts in Basic Training and Advanced Individual Training, some of the AIT(CS) subefforts were initiated previously under other Work Units (e.g., APSTRAT and VOLAR-EVATP) and were continued and carried to completion under ATC-PERFORM. In addition, a number of AIT(CS) activities were initiated during the conduct of ATC-PERFORM.

GENERAL

A staff member attended the AIT(CS) Commander's Conference in September 1972 at Fort Dix, to acquaint AIT(CS) training managers with the scope and objectives of ATC-PERFORM. Particular emphasis was placed on the desirability of tripartite interaction and involvement (HumRRO-Proponency-ATC) in all of ATC-PERFORM's activities concerned with the performance orienting of courses of instruction conducted in training centers.

In November 1973, as part of a TRADOC team, a HumRRO staff member participated in the 3d United States Army, Europe (USAREUR)—German Army Exchange Conference in Oberammergau, Germany. The major topic of the conference was evaluation of individual, team, and unit training effectiveness. The TRADOC team presentation focused on the development and utilization of performance-based training and the evaluation of individual and team effectiveness.

SIGNAL

MOS 36K (Tactical Wire Operations Specialist)

During 12-16 March 1973, a HumRRO staff member participated in a working conference at Fort Gordon, to complete the systems engineering of the 36K course. Because of the unique nature of the course structure (operating under the peer-instructional model developed under HumRRO Work Unit APSTRAT), special assistance was given to the Curriculum Division and the Evaluation Division of the U.S. Army Southeastern Signal School (USASESS) as they prepared a usable Army Subject Schedule for this course.[1] Following the conference, the draft Subject Schedule was reviewed by HumRRO and detailed comments and additional support materials were forwarded to USASESS for completion of the document.

Nothing further was heard until early in February 1974, when it was learned that a SubjScd for 36K was in the printing process. Because this version had not been reviewed by HumRRO, TRADOC withdrew it from further processing and requested HumRRO review and comments. The review was conducted, and comments were forwarded to

[1] The peer-instruction approach had already been implemented in the 36K course at five Army Training Centers early in 1972.

TRADOC late in February 1974 along with a completely reworked ASubjScd which, with a few minor requirements to be completed by USASESS, would have constituted a publishable, field-usable document. However, in May 1974, HumRRO was contacted by USASESS for more input on the rewriting of the draft ASubjScd.

In June 1974, HumRRO received the rewritten documentation from USASESS for review, comment, and/or recommendations. HumRRO comments included the fact that, once again, completeness and usability of the document had been lost in the process of rewriting by school personnel who were not well-versed in the instructional technology under which the course was operating in the training centers. Recommendations included close HumRRO coordination and direct work with USASESS and TRADOC representatives to preclude further fruitless document preparation. In July 1974 the matter of HumRRO involvement with the Subject Schedule was referred by the research staff to the Contractor Monitor. It was noted that the extensive revisions submitted in February remained relevant and should be included in the Subject Schedule. No further comment was sought or received from HumRRO staff. In October 1974 a draft ASubjScd for the course was sent by TRADOC to the field for review.

MOS 05E (Voice Radio Operator)

In October 1972, at the request of USASESS, instructional materials for converting the 05E course to the peer-instructional approach being used in the 36K courses were reviewed by HumRRO staff. The materials were found to be well-prepared and complete, and only minor revisions were seen as necessary. The 05E course at Fort Dix was successfully converted to the peer-instructional approach using the materials provided by USASESS. Fort Dix trained radio operators under peer-instruction until the 05E course was discontinued.

TRANSPORTATION

MOS 64C (Motor Transport Operator)

Early in FY73, HumRRO was asked to work with Transportation School and ATC (Fort Ord) personnel in the review and revision of a performance-based draft ASubjScd for these MOSs. In March 1973, HumRRO's favorable comments on the incorporation of performance training and testing principles in the draft ASubjScd were submitted to the Transportation School. This draft ASubjScd had been distributed for field use late in 1972 and the tests were subsequently published as TRADOC Pamphlet 600-13, *Soldiers' Manual Army Testing (SMART). Motor Transport Operator MOS 64C20/30*, October 1973.

In January 1973, at the request of Fort Ord, HumRRO provided technical guidance to course personnel on the collection of baseline data in the new, performance-oriented course in preparation for undertaking a possible conversion to the peer-instructional approach used in the 36K course. The data gathered indicated that the new performance-based course was effective in meeting the training goals. Further, discussions with course personnel indicated that formal peer instruction would not be feasible because of severe time restrictions. In addition, peer instructors would be used only in a passive role for most of the course. Early in FY74, on the basis of this information, HumRRO recommended that no change in instructional technology be made as long as the course remained performance-oriented in both instruction and testing, and was producing course graduates who met the training objectives.

Early in FY75, at the request of the deputy commanding general, Fort Ord, HumRRO staff studied the feasibility of self-pacing the course. The study found self-

pacing to be feasible within existing resources, and a plan was developed. Due to subsequent reduction of input to the course and to the phase-out of Fort Ord as a training center, the plan was not implemented.

No further HumRRO work was undertaken with this course.

ORDNANCE

MOS 63B (Wheel Vehicle Mechanic)

Due to fiscal limitations near the end of FY72, HumRRO staff was able to provide only minimal guidance to Fort Ord trainers as they developed a peer-instructional program for the 63B course. By the beginning of FY73, the course at Fort Ord was operating under a somewhat modified peer-instructional approach, and HumRRO staff members continued to provide guidance on the refinement of performance tests and support documents.

In December 1972, a comparative test of the 63B courses at Fort Jackson (conventional) and Fort Ord (peer-instructional) was conducted by personnel from U.S. Army Ordnance Center and School (USAOC&S). HumRRO personnel interacted with the testing team and observed the testing conducted at Fort Ord. HumRRO's comments on the test—which was thought to be unreliable—were submitted to TRADOC. These comments included recommendations for USAOC&S coordination with ATC-PERFORM staff to obtain assistance and guidance in developing and implementing a good performance-based mechanic course.

Such coordination was not established, but in May of 1973, USAOC&S sent a new draft ASubjScd to Fort Ord. At TRADOC's request, HumRRO staff reviewed the draft ASubjScd and found that it did not adequately incorporate performance principles, and required extensive revision. HumRRO recommended that a Proponency-TRADOC-ATC-HumRRO working group be established to rewrite the SubjScd.

In August 1973, representatives from HumRRO and TRADOC visited the Ordnance School for the purpose of reviewing the ASubjScd for the course. When it became apparent that those responsible for preparation of the ASubjScd had only a limited understanding of performance-training methods, the conference became a week-long workshop on the development of a performance-oriented training system. Included were the development of task lists, selection of performance objectives, writing of performance tests, and the characteristics of a performance-oriented ASubjScd.

In September 1973, HumRRO reviewed a task list developed by the Ordnance School and submitted comments. Based upon this task list, performance objectives were selected and performance tests written by Ordnance School personnel. These materials were incorporated into a completely new ASubjScd and a draft submitted to HumRRO for review in December 1973. Suggestions were made for revising the instructions on quality control, administering performance tests, and providing more guidance on the use of peer instructors. Detailed additions to the performance tests were provided by example.

In March 1974, the Commandant of the Ordnance School visited Fort Ord where he reviewed the course operation in detail and was briefed on the history of HumRRO/Fort Ord/Ordnance School interactions. He left a copy of the draft ASubjScd 9-63B20 and requested HumRRO's comments. Comments were provided to the Ordnance School and TRADOC, indicating that the document met all the requirements for performance training and testing. It was published in December 1974. No further work was undertaken in this area except for assisting Fort Ord course personnel in the refinement of their performance tests and providing occasional assistance as requested.

CLERICAL

During the latter half of FY73, review of instructional materials related to the Clerk and Clerk-Typist courses (71B) and the Personnel Specialist Course (71H) was conducted, and contact established with course personnel at Fort Ord.

As a remedy for the high end-of-course failure rates observed in the 71B courses, HumRRO suggested alternative plans for better quality control to the Adjutant General School. These were tried out at Fort Ord, and the results indicated a need for review of the program instruction materials and tests being used in the course. Recommendations for a proponent school-ATC-HumRRO conference on these courses were submitted in March 1973.

In April 1973, TRADOC guidance to the ATC-PERFORM staff was to confine activities with the 71B courses to providing assistance at the operational level and to undertake performance orientation of the Personnel Records Specialist Course (75D) which was scheduled to replace 71H.

Fort Ord course personnel indicated that the 75D course would not begin at that post until early 1974. A review of the SubjScd indicated little probable need for revision. It was agreed between HumRRO and Fort Ord staffs to delay active involvement in this course until early FY75.

Detailed study of the 75D course began in October 1974 with observation of classes, examination of training materials, and interviews with both students and members of the faculty. Problems were identified and recommendations for improvement were made. Experienced NCOs were assigned to work with HumRRO staff in the development of the materials required to implement the recommendations. The time schedule for this subeffort called for developing and field testing the materials over the period January-May 1975.

The work was under way when it was learned, in December 1974, that the 75D course at Fort Ord would be phased out, the last class to start training during the first week of February 1975. As a result, it was decided to telescope the planned research and development effort into four activities:

(1) The development of two sets of cross indexes, one for officer records and the other for enlisted records, to be used as instructional vehicles in the 75D course and as job aids after assignment as a Personnel Records Specialist.

(2) The development of two comprehensive performance tests, one for officer records and the other for enlisted records, to be used for instruction and testing in the course.

(3) The development of lesson outlines and training materials to be used in the course, again one set for officer records and the other for enlisted records.

(4) The development of a document to provide guidance on organization and conduct of the new training program.

The development of these materials continued through April 1975. Progress was hampered when the course phase-down at Fort Ord resulted in reassignment of faculty and the requirement for the NCOs assigned to the research and development project to act as instructors rather than course developers. Further, there were few students available on whom to pilot test the new material. Nevertheless, some pilot testing of the materials was conducted.

The need for a cross index to help the Personnel Records Specialist in processing officer and enlisted records was anticipated in the HumRRO Report, *A Survey of User Attitudes Towards Army Training Literature (March 1974).*[1] It was found that one of

[1] Morris Showel and Mark F. Brennan, *A Survey of User Attitudes Towards Army Training Literature*, HumRRO Final Report prepared for the U.S. Army Research Institute, March 1974.

the most common complaints about Army publications is that needed information is scattered among a number of different publications. One of the most frequent suggestions made for improving Army publications was either the consolidation of information within one document, or the preparation of a "master index." The "cross index" prepared here exemplifies the latter approach.

While some members of the Fort Ord course faculty were initially doubtful about the utility of a "cross index," in the course of developing the index they came to view it favorably. Preliminary versions of the "cross index" also were reviewed by the heads of the Enlisted and Officer Records Sections, Headquarters, Fort Ord, and promptly implemented as job aids in their sections.

All the materials developed in the course of this work were designed to incorporate the principles of performance-oriented training. The emphasis has been placed upon teaching skills that the entry-level job incumbent must perform. Two prototype kits (Officer and Enlisted) containing all the instructional materials and the guides for their use were submitted to the ARI Contract Monitor for transmission to the U.S. Army Institute for Administration (USAIA) and TRADOC in the last quarter of FY75.

QUARTERMASTER

MOS 94B (Cook)

Toward the middle of FY72 the staff of Fort Ord's Food Service Course was engaged in modifying their cook's course in an effort to individualize the training, make the course more performance-oriented, and incorporate performance tests. Since ATC-PERFORM had not yet been funded, HumRRO was able to provide only limited assistance. At the time formal ATC-PERFORM involvement began in FY73, differences had developed between Fort Ord course personnel and course proponents at the Quartermaster School (QMS). Each group wanted to retain its own training program. The Quartermaster School, being the proponent agency, understandably viewed its program as taking precedence over field-developed training programs.

In January 1973, the Fort Ord Cook's Course was reviewed in detail by HumRRO. A report of this review was submitted to TRADOC in March 1973. This report suggested that a Quartermaster School-Fort Ord-HumRRO conference be held and suggested topics for consideration. The object of the suggested conference was to establish a tripartite working arrangement to resolve some of the growing differences between the Quartermaster School and Fort Ord.

In March 1973, the QMS Director of Instruction (DOI) visited the Fort Ord Food Service Course. As a result of a briefing and discussions with Course and HumRRO staff, the DOI expressed interest in a tripartite conference and in the concepts being tried in the Fort Ord program.

In April 1973, a report on the Fort Ord program (with data from five cycles) was submitted by Fort Ord to TRADOC. Fort Ord course personnel were enthusiastic about their program and eager to reach resolution with the QMS. Meanwhile, TRADOC had directed the QMS to cut the existing 10-week program to 8 weeks. The resulting 8-week program contained little job-functional, performance-oriented training.

In May 1973, both Fort Ord and HumRRO were requested by TRADOC to review a draft of ASubjScd 10-94B20 prepared by the QMS, and to submit comments and recommendations. HumRRO comments on the "quick-fixed" document were not favorable, and it was recommended that the document not be approved for field use.

As a result of these continuing disagreements, TRADOC called for a QMS-Fort Ord-HumRRO conference to be convened at Fort Lee to resolve differences and produce

a usable ASubjScd for Cooks. The conference was called for 23 July and scheduled to last as long as necessary to reach resolution.

A primary objective of HumRRO participants in the conference was to bridge the gap between the QMS and Fort Ord representatives. Over the first several days of meeting, misunderstandings were uncovered and reconciled, new information was exchanged, and new ground was discovered on which the two agencies met and agreed. From this point on, a smoothly functioning working group cooperatively produced a usable, performance-oriented ASubjScd which was submitted to TRADOC in August 1973.

Late in 1973, the ASubjScd was sent to Fort Ord and Fort Jackson for field trial. Because of facilities and equipment problems at Fort Ord, they were relieved (in January 1974) from operating under the provisions of the test ASubjScd and continued to operate under local procedure. Fort Jackson reported favorably on the new training program following their first run in January 1974.

In February 1974, HumRRO and Fort Ord representatives presented briefings and held detailed discussions with a visiting team from the QMS. Heading the team were the Commandant, QMS, and the new DOI. In these meetings resolution was achieved on the approach to performance-orienting both the Food Service Course and the Supplyman Course (see following section). Except for occasional local assistance, ATC-PERFORM had no further involvement in the Food Service Course.

MOS 76Y (Supplyman)

In August 1972, representatives from the Supplyman Course at Fort Polk visited the Fort Ord course and met with HumRRO staff members to discuss performance-orienting the course. The QMS had given Fort Polk the responsibility for restructuring the course and preparing a draft ASubjScd for submission to TRADOC. In February 1973, a draft ASubjScd was submitted to TRADOC from Fort Polk. As there had been no HumRRO input or guidance beyond the initial two-day meeting of the previous August, ATC-PERFORM staff recommended that they be permitted to review the document. Further, it was suggested that responsibility for experimental course modifications and field trials be transferred to Fort Ord since the course at Fort Polk was to be discontinued at the end of FY73.

The draft ASubjScd was reviewed by TRADOC staff and returned to the QMS for revision in June 1973. At this time, TRADOC requested that ATC-PERFORM staff participate in revising the ASubjScd to incorporate performance-training principles. At a working conference held at the QMS in July 1973 for review and revision of the ASubjScd, complete revision of the document was indicated. At this time ATC-PERFORM staff oriented QMS personnel on the principles of performance-based training and testing, and worked with them to produce a prototype performance test for use as a guide in preparation of the remaining tests. Coordinated QMS-HumRRO revision of the ASubjScd continued through August and October, when the revised draft was submitted to TRADOC.

Publication of the document was deferred pending field trial of the performance tests at Fort Ord. HumRRO made arrangements with Fort Ord course personnel to conduct the field trial in conjunction with a self-paced instruction project to be undertaken in the Supplyman Course. Data were collected and findings submitted to TRADOC and QMS in March 1974. With the incorporation of changes indicated by the field trial of the tests, the ASubjScd went forward for publication. ATC-PERFORM staff then undertook planning for a study of the feasibility of self-pacing the Supplyman Course conducted at Fort Ord. (See Chapter 6, Self-Pacing.)

MILITARY POLICE

MOS 95B (Military Policeman)

The Basic Law Enforcement Course (MOS 95B) was added to TRADOC's list of priorities for inclusion in Work Unit ATC-PERFORM early in FY74. Initial coordination visits were made to the Military Police School (USAMPS), Fort Gordon, in the summer and fall of 1973 to discuss training philosophy, training approaches, and special MP training problems. USAMPS representatives visited HumRRO's Presidio of Monterey office in December to establish a working relationship, select a task for initial experimental work, and develop a timetable for the project.

One complete job task, "Investigate an Incident," was selected for the development of a pilot program. This task was selected because the subtasks and supporting skills included are both "hard" and "soft," and constitute a large and critical portion of the Military Policeman's total job. This job task also comprises a large part of the common-base portion of the courses for both 95B and 95C (Correctional Specialist) conducted at USAMPS.

In January 1974, work commenced at USAMPS with a series of working meetings involving the Basic Law Enforcement Course committee chiefs and instructors who have responsibility for instruction in "Investigate an Incident." The general method of course development employed was a synthesis of three approaches:

System Engineering: The sequence of major steps as prescribed by TRADOC Regulation 350-100-1 was followed. Job analysis and identification of tasks to be trained in the course had been previously accomplished by the USAMPS Curriculum Branch and were used as a starting point for the project. Training analyses and the development of performance-based tests and instructional techniques were conducted under HumRRO's guidance and constituted the remainder of the systems development activities.

Group Problem-Solving: A number of working groups composed of course personnel and HumRRO staff combined their diverse and complementary knowledge and skills to generate solutions to problems of analysis and course development.

Informal Peer Instruction: Instructors and supervisors with special aptitude for systems engineering were given the responsibility to help other instructors apply the approach in course development.

The unanticipated decision to relocate USAMPS at Fort McClellan in early FY76 imposed numerous higher priority planning, logistic, and moving requirements upon the course managers and instructors included in the project. Nevertheless, by the spring of 1974 all methods and media selections were made and all performance tests were developed and evaluated by administering them to students who had just completed formal instruction. An individualized, open-access curriculum was developed for the job task of investigating an incident. This curriculum gave the basic MP student considerable flexibility and choice in the use of a variety of instructional techniques made available (e.g., video-taped demonstrations, slide-tape programs, practical exercises, peer instruction, and performance tests) as he proceeded through a series of instructional modules.

A class selected for a trial run of the pilot program initiated training in May 1974. Fifty-one of these students were diverted from conventional instruction for two weeks of training under the experimental "Investigate an Incident" techniques. Data were collected on student performance and student and cadre attitudes. Prior to the initiation of experimental training, 56 students from a conventional class were administered the same performance tests that were to be given to the 51 students in the experimental class.

Only minor operational problems were encountered with the pilot program. Instructor and student attitudes were favorable to the new design. The group of students trained in the pilot program surpassed by a significant margin the performance of the control group that had been taught the same material through conventional methods.

In summary, it was concluded that:

(1) Performance-oriented training can be designed to achieve both soft and hard skill objectives within the limits of reasonable cost.

(2) Early involvement of course personnel in instructional design assures a high level of acceptance by them of a new course and of their new functions in its operation.

(3) Students trained under individualized open-access techniques achieve levels of performance superior to students trained under conventional classroom methods, and they prefer such instruction to the conventional.

A report describing these activities was prepared as one of the six companion reports to this summary report.[1]

On the basis of the successful trial run results, systems engineering of the entire Basic Law Enforcement Course was undertaken in accordance with performance, open-access, training-design principles. This joint HumRRO-USAMPS activity continued intermittently through the rest of FY75 as USAMPS moving preparations permitted. With ATC-PERFORM funding terminating the end of FY75, a proposal to provide USAMPS with HumRRO assistance in completing, installing, refining, and evaluating the course at Fort McClellan was being negotiated as of the date of this writing.

[1] J. Richard Suchman, Albert L. Kubala, and John E. Taylor, *The Development of an Open-Access, Performance Oriented Curriculum for Training the Military Policeman (MOS 95B20)*, HumRRO Final Report FR-WD(CA)75-9, June 1975.

Chapter 6

SELF-PACING INDIVIDUAL INSTRUCTION

In January 1973, TRADOC distributed a letter, "Self-Paced Instruction in AIT," directing all Army schools to determine which of their AIT courses were adaptable to self-pacing. The Engineer School at Fort Belvoir, in coordination with Fort Leonard Wood and HumRRO, nominated the Crawler Tractor Operator Course, MOS 62E, and the Utility Worker's Course, MOS 51A, as candidates for self-pacing. The Quartermaster School at Fort Lee nominated the Supplyman Course, MOS 76A (now 76Y).

In November 1973, TRADOC designated the Crawler Tractor Operator Course at Fort Leonard Wood and the Supplyman Course at Fort Ord for the experimental study of self-pacing. The selection of these two courses provided for study of diverse types of skills—the gross motor skills of heavy equipment operation in the one, and cognitive clerical and computational skills in the other. The study was to commence during 3d quarter FY74.

USATC responsibility was primarily in providing support for the conduct of the experiments. Proponent school responsibility was oriented toward the determination of course objectives. HumRRO was responsible for instructional technology, training organization, experimental design and data analysis, and report preparation.

TRADOC's goals in the self-pacing studies were to determine the optimum course organization and the most effective instructional techniques for self-paced training in a job-performance approach rather than through programed texts. Of particular interest was the use of self-pacing and peer instruction in courses with fluctuating inputs to determine the feasibility of a free-flow, peer-instructional system which had been developed in a previous HumRRO study.[1]

The general experimental plan provided for collection of performance, administrative, attitude, and cost-effectiveness data before, during, and after institution of self-pacing techniques. The primary focus of the experiments was on the effects of self-pacing approaches on management and system variables.

SELF-PACED INSTRUCTION IN MOS 76Y (SUPPLYMAN) AT FORT ORD

Coordination of the self-pacing study with Fort Ord course personnel began in January 1974. At the same time that the performance tests for the new ASubjScd were being field tested, course personnel prepared the materials necessary for converting the ongoing course to the seven-week performance-oriented course outlined in the new ASubjScd. Collection of administrative baseline data for the self-packing study was initiated also at this time.

[1] Jacklyn E. Hungerland, *A Career-Oriented, Free-Flow, Peer-Instructional System*, HumRRO Professional Paper 6-73, June 1973; and

Jacklyn E. Hungerland, Eugene R. Michaels, and John E. Taylor, *Development and Pilot Test of a Career-Oriented, Peer-Instructional Model in the Office Cluster of Business Occupations*, HumRRO Technical Report 72-28, October 1972.

When the field testing of the new performance tests was completed, attention turned to converting the Fort Ord course from lecture-centered techniques to the performance-oriented techniques prescribed by the new ASubjScd. This conversion was completed in the spring of 1974, the major change being the institution of the performance tests with a GO/NO GO criterion and the conduct of training in a more functional, job-related context. With the new ASubjScd implemented, and while baseline data were being collected, preparations were undertaken jointly by HumRRO and course personnel to introduce self-pacing.

In each of the three major sections of the course (Unit and Organizational Supply, Stock and Accounting Control, and Warehousing), these preparations included (a) orientation of instructors, (b) preparation of instructional materials, (c) training of instructors, and (d) organization of facilities.

In briefest outline the self-pacing approach reorganized the course materials, personnel, and facilities around 19 training stations—eight in Unit and Organizational Supply, four in Stock Control and Accounting, and seven in Warehousing. Trainees flowed through the stations, one by one, at their own individual pace. At each station they (a) were oriented on the procedures and skills to be learned, (b) studied and practiced with instructor help and supervision, and (c) were tested on their performance when they were ready. As the trainees met each station's objectives, they proceeded to the next, moving from station to station (and section to section) until all course performance objectives had been met.

This study demonstrated that self-pacing is a highly effective technique for managing training. Fluctuating inputs to the course, and varying flow rates through the course, were accommodated without undue strain. The system functioned in spite of instructor skepticism and reluctance to depart from the familiar and comfortable group lock-step. It survived extreme staff turnover during the conduct of the study. The system had strong appeal for the trainees, who averaged five weeks to complete the course. The fastest learner finished in 13 days, while the slowest required 44. Details of the supplyman self-pacing study, (procedures, course design, data, and findings) are presented in a report prepared as one of the six companion reports to this summary report.[1]

In summary, it was concluded that:

(1) Self-pacing is feasible and highly effective in implementation and operation. This approach permits efficient utilization of facilities, personnel, and equipment, and allows for more efficient utilization of time and more efficient management of student input fluctuations.

(2) Self-pacing using job-related skill practice is effective in cognitive skill training.

(3) Self-pacing is well received by students and instructors.

SELF-PACED INSTRUCTION IN MOS 62E (CRAWLER TRACTOR OPERATOR) AT FORT LEONARD WOOD

In response to TRADOC's self-pacing directive, representatives from the Engineer School, HumRRO, and Fort Leonard Wood (FLW) met to discuss self-pacing concepts and nominate courses for self-pacing. Anticipating selection of the Crawler Tractor Operator Course (CTOC), FLW personnel designed and installed an "incentive" program in their CTOC in mid-1973. This program and its cumulative refinements (Self-Paced I) was a testbed for, and led directly to, the formal experiment begun in January 1974 (Self-Paced II).

[1] Jacklyn E. Hungerland and John E. Taylor, *Self-Pacing A Cognitive Skill Course: Supplyman, MOS 76Y10*, HumRRO Technical Report 75-20, June 1975.

In January 1974, HumRRO, Engineer School, and FLW representatives devised a general plan for integrating Self-Paced II concepts with FLW's ongoing Self-Paced I program. A data-collection plan for baseline data was developed by HumRRO and placed in effect by FLW.

In the two-month period February-March 1974, lesson plans, texts, and the existing ASubjScd were reviewed, and performance tests written. Close coordination was maintained among HumRRO, course personnel, and the Engineer School during all these activities. Baseline data collection was begun.

In April 1974, just before the first class was to undergo Self-Paced II instruction, a HumRRO representative visited FLW to conduct instructor indoctrination and to administer attitude survey instruments. At the same time a system for control and management was established whereby instructors could track trainee progress and utilize flexible scheduling to achieve individual self-pacing through the course.

This system permitted trainees to stay in the CTOC for the full seven weeks, if needed. Trainees who could pass the CTOC performance tests after three, four, or five weeks were given the options of serving as peer instructors in the CTOC or moving on to other courses (e.g., Wheeled Tractor, Scooploader, Motorgrader). Many trainees did both.

This study demonstrated, as did the Supplyman study, that self-pacing is a highly effective technique for managing training. This system permitted more efficient utilization of time, facility, and personnel resources.

In summary, it was concluded that:

(1) Self-pacing applied to a motor skills course is both feasible and practical. The system is accepted by both trainees and instructors.

(2) Self-pacing provides the options of achieving higher skill proficiency or of making substantial savings of time in the training base by accelerating the assignment of trained individuals to operational units.

Details of the Crawler Tractor Operator self-pacing study (procedures, student flow, data, and findings) are presented in a separate report prepared as one of the six companion reports to this summary report.[1]

[1] Mark F. Brennan and John E. Taylor, *Self-Pacing a Gross Motor Skill's Course: Crawler Tractor Operator, MOS 62E20*, HumRRO Technical Report 75-19, June 1975.

Chapter 7

RESERVE AND NATIONAL GUARD TRAINING AND NCO LEADERSHIP/INSTRUCTOR TRAINING

In establishing priorities for the several subefforts of activity for ATC-PERFORM, TRADOC assigned the lowest priorities to the two areas of Reserve and National Guard Training and NCO Leadership/Instructor Training. Accordingly, staff assignments to these two areas were lighter than to the others. Work in each of these was carried on as a secondary mission by several members of the staff who had primary missions in BCT, AIT, or AIT(CS). Guidance from TRADOC was to delete these two areas entirely at the end of FY 74.

RESERVE AND NATIONAL GUARD TRAINING

As part of the EVAPT, HumRRO staff had held a series of briefings during the latter months of FY72 to assist personnel of two Reserve training divisions as they prepared to conduct performance-oriented training in BCT, AIT, and AIT(CS) during their FY73 summer training duties at Fort Ord.

The first briefing of Reserve unit personnel took place in March 1972 when a HumRRO team briefed the training officers of the 91st Division (Training) during their pre-camp conference at Fort Ord. Officers and NCOs of Division Headquarters and the 1st Brigade (BCT) were briefed by a HumRRO team in April at the Division home training base in Sacramento, California. Officers and NCOs of the 2d Brigade (BCT) were briefed in May at Hamilton Air Force Base during a weekend training session. Personnel of the 4th Brigade (CST) were briefed at Fort Cronkite, California by a HumRRO team in May. During July and August 1972, when the 91st Division was on active duty at Fort Ord and conducting the instruction of trainees, key personnel of the Division (including the Commanding General and the Deputy Commanding General) were briefed. These two briefings were held separately to coincide with the Division's two active duty increments. Subsequent work with the 91st Division was done on a continuing basis by Fort Ord training staff to assist them in certifying their Drill Sergeants in all the performance tests required for BCT.

Briefings for key personnel of the 104th Division (Training) on the concepts and techniques of performance training were conducted in April 1972 by a HumRRO team which traveled to Vancouver, Washington for that purpose. The 104th Division performed its active duty training at Fort Ord, California in June 1973 and again in June 1974. Fort Ord trainers also assisted this Division in certifying their Drill Sergeants in the BCT subjects and tests.

In April 1973, a HumRRO team briefed the California Army National Guard training officers and their advisors on performance-oriented training. In April 1974, before a similar group, a HumRRO team briefed on skill training management and management by objectives. Approximately 100 officers involved in the training of National Guard units attended each briefing.

Additional briefings in the Reserve and National Guard subeffort were held as follows:

(1) In August 1972, briefings were held for all the ROTC instructors of the 6th Army Area at the Presidio of San Francisco on performance-oriented training and its possible application in instructional methods for ROTC.

(2) In April 1973, briefings were held for the Reserve Component Advisors of units based on Fort Ord for their Reserve training. Discussions were held on implementing performance-oriented training.

(3) In October 1973, briefings were held for the Advisor to the 111th Armor Group, California Army National Guard. Discussions were held on working with this unit to implement performance training in their other-than-active-duty training sessions.

(4) Late in 1974, discussions were held with representatives of the California Army National Guard on the implications for their training program of the volunteer force concept, the Enlisted Personnel Management System performance-oriented training plan, and their own equipment and facility constraints. HumRRO, having developed training materials for M48 tank commanders and crewmen under Work Unit SHOCK-ACTION, provided copies of the training documents to the 40th Infantry Division (Mech), California Army National Guard.

In the Reserve and National Guard units, briefings and work sessions stimulated considerable interest in the development of methods to be used for the training of unit personnel during their periodic weekend drill periods. However, ATC-PERFORM resources and priority assignments permitted only the activities outlined above.

NCO LEADERSHIP/INSTRUCTOR TRAINING COURSES

The leadership component of Work Unit ATC-PERFORM involved work in three training programs: the Special Leader Preparation Program (SLPP), the Drill Sergeant School and Drill Sergeant Course (DSS/DSC), and the Instructor Training Course (ITC).

Special Leader Preparation Program

At the time of ATC-PERFORM involvement, the Special Leader Preparation Program (SLPP) was a one-week leadership course designed to prepare trainees in BCT for leadership responsibilities in AIT. The course was conducted for specially selected BCT trainees during the last week of the BCT cycle. Trainees assigned to the SLPP were selected by BCT company cadre during the 5th week of the BCT cycle, with priority given to high-aptitude trainees occupying trainee leader positions.

The SLPP was an outgrowth of the Leader Preparation Program (LPP) developed by HumRRO and implemented by the Army in 1962. The LPP originally consisted of two components, (a) a two-week leader preparation course given after completing BCT and before starting AIT and (b) eight weeks of supervised on-the-job training given in AIT. The leader preparation part of the program had subsequently been shortened to one week and integrated with BCT in order to reduce training time and to overcome trainee reluctance to spend two additional weeks in a training status.

The SLPP research was conducted at Fort Ord, California in July and August 1972, and consisted of observing SLPP classes, interviewing BCT company cadre, SLPP trainees, and SLPP faculty, collecting aptitude and achievement scores of SLPP trainees, and examining training materials and testing materials used in the SLPP. A report on the work was subsequently submitted to the Directorate for Plans and Training, Fort Ord.

In addition to making recommendations regarding the conduct of the one-week leadership course, HumRRO staff made recommendations on how to increase the

performance orientation of both the training and the testing activities, on the selection and orientation of trainees assigned to the SLPP, the conduct of the two-week accelerated phase of the SLPP, and the utilization of SLPP graduates on the completion of the program.

HumRRO involvement with the SLPP was completed in December 1972. The SLPP was subsequently discontinued at Fort Ord as a consequence of the phasing-out of their Army Training Center mission.

Drill Sergeant School/Drill Sergeant Course

The Drill Sergeant School (DSS) and the Drill Sergeant Course (DSC) are approximately six-week programs designed to teach selected non-commissioned officers and specialists the fundamentals and techniques of conducting individual training in training centers and units. While the DSS is designed for active Army units and the DSC for reserve Army units, the content of the two programs is substantially the same.

ATC-PERFORM activities in the DSS/DSC area really began in May 1972 with a review of their newly revised Program of Instruction (POI). The POI showed many deviations from the concepts of performance-oriented training.

In June 1972, two members of the HumRRO staff attended a symposium at Fort Benning, at which time representatives from the various DSS/DSC met to review the POI. HumRRO staff emphasized the need to:

(1) Specify terminal training objectives and maximum hours for each block of instruction, and allow each DSS/DSC to develop its own procedure for attaining these objectives.
(2) State all terminal objectives in a performance-oriented format (actions, conditions, standards).
(3) Adhere to the principles of performance-oriented training.
(4) Use performance rather than multiple-choice tests to measure student achievement.
(5) Standardize test instruments and test procedures.

Limited progress was made in all but the fifth area.

In November-December 1972, HumRRO personnel observed the DSS then being conducted at Fort Ord. Observation took the form of attending a representative sample of classes, examining training and testing materials, and interviewing students and cadre. The DSS, as conducted at Fort Ord, exhibited the same problems as were noted in the POI. A written report of the observations was subsequently submitted to Fort Ord and TRADOC.

In September 1973, HumRRO personnel reviewed a new draft of the POI, and in October 1973 attended the DSS/DSC symposium held at Fort Benning, where the new draft POI was reviewed by representatives from each of the DSS and DSC. Most of the weaknesses noted in the 1972 POI were still evident in the 1973 POI. The major achievement of the 1973 meeting was the decision that Fort Benning would prepare test instruments and test procedures to be used by the separate DSS and DSC, and that the Effective Military Instruction (EMI) component of the DSS/DSC would incorporate the materials and procedures newly prepared by HumRRO for the Instructor Training Course (see "Instructor Training Course" following).

In May 1974, HumRRO personnel reviewed a revised draft of the POI. This draft incorporated some of the suggestions made by HumRRO personnel at the 1973 symposium, but appeared to need work in a number of important areas.

INSTRUCTOR TRAINING COURSE

The Instructor Training Course (ITC) is a two-week course designed to prepare noncommissioned officers and specialists for instructor duties. HumRRO involvement in the ITC began in December 1972 when two members of the HumRRO staff were requested for temporary duty at the Armor School to assist in the preparation of a performance-oriented POI for the ITC. Subsequent to preparation of the POI and submission to TRADOC, proponency for this POI was transferred to the Infantry School, and again HumRRO provided input for making it performance-oriented. This POI was approved by TRADOC and sent to the various training centers for implementation on a trial basis.

In March 1974, HumRRO proposed to visit a sample of operating ITC to determine what problems, if any, had arisen in efforts to implement the performance-oriented POI. In April-June 1974, HumRRO personnel observed the ITC at Fort Ord, Fort Leonard Wood, and Fort Knox. Observation consisted of attending a representative sample of classes, examining training and evaluation materials, and interviewing cadre and students. These observations indicated that while the three ITC continued to implement major components of the performance-oriented POI, in a number of respects they had reverted to conventional platform training. Major deviations from performance-oriented training concepts were (a) overemphasis on the lecture/conference as opposed to the performance-oriented training technique, (b) no requirement that the student demonstrate GO/NO-GO mastery of critical teaching skills, and (c) overemphasis on ritualistic behavior. A report of these observations was submitted to TRADOC and to the USAIS.

A "How To Do It" Manual

A high-priority activity that TRADOC had requested of ATC-PERFORM was the drafting of a manual, for use by ATC personnel, on the conduct of performance-oriented training. During FY73, such a manual was prepared for use by brigade/battalion/company-level training managers and trainers. The manual explains, in practical terms for operational use, the principles on which performance training systems are based, the proper use of performance tests, the conduct of performance training, the differences between performance and conventional training, and management considerations in performance training systems.

The manual was submitted to TRADOC in June 1973 and was published, unchanged, as TRADOC Pamphlet 600-11, *Guidelines for the Conduct of Performance Oriented Training*, October 1973. The pamphlet has been reprinted, and has been distributed in quantity for use at all ATCs. In addition to the ATC distribution, large number of copies have been provided for use at Army schools and by units in the field.

Chapter 8

EPILOG

ATC-PERFORM has been a catalyst for accomplishing institutional change in the instructional system used in Army Training Centers. The change has affected training managers, instructors, and trainees. Change in instructional methods has been directed away from the platform and subject-oriented systems to a performance-oriented system. Training objectives which facilitate an individual's learning skills of a job at entry level are emphasized. Training is focused on the individual rather than the group. The instructor becomes the manager and organizer of skill instruction rather than a presenter of information.

Institutional change in a large organization does not take place easily or quickly. While the trainee adapts readily to this new system and finds performance-oriented training both meaningful and motivating, the process of introducing change through training managers and instructors who are products of the conventional system takes time and effort. The new techniques are often mistakenly interpreted as an affront to the professional stature of a qualified instructor for a variety of reasons:

(1) More work is involved.

(2) The checkout of individual skill performance takes more time and effort than administering and grading a written quiz.

(3) Remediation or redrilling a trainee in a skill sequence after a GO/NO GO performance test is often seen as unnecessary.

(4) Quality-control procedures which provide a more complete check on what instructors are presenting and the standards they apply during performance checkout are especially threatening to those instructors who are marginal in their own skill performance and knowledge. Time is needed to introduce the new methods to both instructors and training managers and, when an understanding of purpose and objective has been reached, to introduce the methods into the instructional system.

The process of converting to a new instructional system also has to contend with considerable "washback" or reversion to the conventional platform method of instruction. Instructors trained in the platform technique are in the habit of using a sizable portion of the class time for the presentation of subject matter. In this presentation time, they often attempt to display their grasp of the subject matter, presenting a series of "nice to know" facts which are only tangential to the trainees' acquisition of a skill. The "washback" occurs when the instructor goes back to his old habits and sense of values and emphasizes the presentation rather than the skill learning. Presentation of knowledge, theory, and other "nice to know" material frequently uses up valuable time which can be more profitably spent by trainees in skill practice.

The reasons for instructor "washback" are many. The instructor may not have been properly trained in performance-oriented training methods. He may confuse talking about a skill with trainees actually performing it, and he may believe he is accomplishing his instructional objectives. Too many instructors attempt to "tell them how to do it" when "show them how to do it" is the requirement. Many also feel that a platform presentation, expertly carried out, is needed to impress the students with the importance of the subject and the ability of the instructor. There is also the attitude that one's

professional stature as an instructor will suffer unless an expert and lengthy presentation is made from the platform.

The instructor must eventually learn that the performance-oriented system of instruction focuses on the individual trainees' becoming proficient in skills rather than focusing upon himself and his own abilities on the platform.

The institutional change process requires supervision from training managers and commanders. If instructional change is to take place, and if the main instructional medium is the instructor, major emphasis must be given to ensuring that instructor behavior does, in fact, change.

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